

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION:	§	EXAMINER: Unknown
S. Mark Haugland	§	
	§	
SERIAL NO.	§	GROUP ART UNIT: Unknown
	§	
FILED:	§	
	§	
FOR: SHEAR WAVE VELOCITY	§	
DETERMINATION USING	§	
MULTI-POLE WAVE	§	

Commissioner for Patents
P. O. Box 1450
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INFORMATION DISCLOSURE STATEMENT

Pursuant to Applicant's duty, under 37 C.F.R. § 1.56, 1.97 and 1.98, to disclose all relevant material, the Applicant lists below the following references believed to be relevant to the subject matter of the above-identified application:

	<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor</u>
1.	4,698,792	10-06-1987	Kurkjian, et al.
2.	5,278,805	01-11-1994	Kimball
3.	6,631,327 B2	10-07-2003	Hsu, et al.

OTHER DOCUMENTS

1. X. M. Tang, et al., "Shear-Velocity Measurements in the Logging-While Drilling Environment: Modeling and Field Evaluations," Petrophysics, Vol. 44, No. 2 (March-April 2003), pp. 79-90.
2. G. L. Varsamis, et al, "LWD Shear Velocity Logging in Slow Formations Design Decisions and Case Histories," SPWLA 41st Annual Logging Symposium, June 4-7, 2000, Paper O.

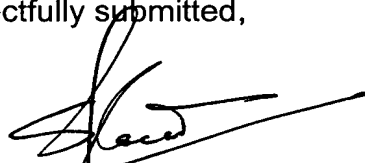
3. C. H. Cheng and M. N. Toksoz, "Elastic Wave Propagation in a Fluid-Filled Borehole and Synthetic Acoustic Logs," *Geophysics*, Vol. 46, No. 7, July 1981, pp. 1042-1053.
4. D. P. Schmitt, "Shear Wave Logging in Elastic Formations," *J. Acoust. Soc. A.*, 84(6), December 1988, pp. 2215-2229.
5. M. T. Taner, F. Koehler, and R. E. Sheriff, "Complex seismic trace analysis," *Geophysics*, Vol. 44, No. 6 (June 1999); pp. 1041-1063.
6. C. H. Cheng and M. Nfi Toksoz, "Determination Of Shear Wave Velocities In "Slow" Formations," *SPWLA 24th Annual Logging Symposium*, June 37-30, 1983, Paper V.
7. Georgios L. Varsamis, et al., "A New MWD Full Wave Dual Mode Sonic Tool Design And Case Histories," *SPWLA 40th Annual Logging Symposium*, May 30 – June 3, 1999, Paper P.
8. F. EL-Wazeer, et al., "Applications For A Full Wave Sonic LWD Tool in the Middle East," *Society of Petroleum Engineers 13th Middle East Oil Show & Conference*, April 5-8, 2003, SPE 81474.
9. Jennifer Market, et al., "Processing and Quality Control of LWD Dipole Sonic Measurements," *SPWLA 43rd Annual Logging Symposium*, June 2-5, 2002, Paper PP.
10. Chaur-Jian Hsu and Kikash K. Sinha, "Mandrel effects on the dipole flexural mode in a borehole," *J. Acoust. Soc. Am.* 104(4), October 1998, pp. 2025-2039.

Applicant respectfully submits that the invention in the above-identified application is patentably distinguishable over the cited references known to Applicant and disclosed in the above Information Disclosure Statement.

This Information Disclosure Statement is being filed **within** three months of the filing date of this national application or the date of entry of the national stage as set forth in § 1.491 in an international application.

Respectfully submitted,

Date: Feb 20, 2004



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--Applicant--

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known			
				Application Number			
				Filing Date			
				First Named Inventor		S. Mark Haugland	
				Art Unit			
				Examiner Name			
Sheet	1	of	1	Attorney Docket Number		PAT029US	

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code (if known)				
	AA	US-	4,698,792	10-06-1987	Kurkjian et al.	
	AB	US-	5,278,805	01-11-1994	Kimball	
	AC	US-	6,631,327 B2	10-07-2003	Hsu et al.	
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FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No.	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ¹
		Country Code-Number-Kind Code					

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ¹
	AD	X. M. Tang, et al., "Shear-Velocity Measurements in the Logging-While Drilling Environment: Modeling and Field Evaluations," <i>Petrophysics</i> , Vol. 44, No. 2 (March-April 2003), pp. 79-90.	
	AE	G. L. Varsamis, et al, "LWD Shear Velocity Logging in Slow Formations Design Decisions and Case Histories," <i>SPWLA 41st Annual Logging Symposium</i> , June 4-7, 2000, Paper O.	
	AF	C. H. Cheng and M. N. Toksoz, "Elastic Wave Propagation in a Fluid-Filled Borehole and Synthetic Acoustic Logs," <i>Geophysics</i> , Vol. 46, No. 7, July 1981, pp. 1042-1053.	
	AG	D. P. Schmitt, "Shear Wave Logging in Elastic Formations," <i>J. Acoust. Soc. A.</i> , 84(6), December 1988, pp. 2215-2229.	
	AH	M. T. Taner, F. Koehler, and R. E. Sheriff, "Complex seismic trace analysis," <i>Geophysics</i> , Vol. 44, No. 6 (June 199); pp. 1041-1063.	
	AI	C. H. Cheng and M. Nfi Toksoz, "Determination Of Shear Wave Velocities In "Slow" Formations," <i>SPWLA 24th Annual Logging Symposium</i> , June 37-30, 1983, Paper V.	
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	AL	Jennifer Market, et al., "Processing and Quality Control of LWD Dipole Sonic Measurements," <i>SPWLA 43rd Annual Logging Symposium</i> , June 2-5, 2002, Paper PP.	
	AM	Chaur-Jian Hsu and Kikash K. Sinha, "Mandrel effects on the dipole flexural mode in a borehole," <i>J. Acoust. Soc. Am.</i> 104(4), October 1998, pp. 2025-2039.	

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.

¹Applicant is to place a check mark here if English language Translation is attached.